AF

PATENT
Atty. Docket No. 1140-2

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPELANT:	Amouris, Konstantinos	EXAMINER:	Cynthia L. Davis
SERIAL NO.:	09/855,297	GROUP:	2665
FILED:	May 15, 2001	DATED:	February 3, 2006

FOR: **METHOD FOR DYNAMICALLY ALLOCATING TIME SLOTS OF A COMMON TDMA BROADCAST CHANNEL TO A NETWORK OF TRANSCEIVER NODES**

Mail Stop Appeal Brief
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

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Enclosed please find APPELLANTS' BRIEF in triplicate.

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Respectfully submitted,

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Dated: February 3, 2006

George Likourezos

PATENT

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P.O. Box 1450
Alexandria, VA 22313-1450

APPELLANT'S BRIEF ON APPEAL

Sir:

Appellant herewith respectfully presents his Brief on Appeal as follows:

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I. REAL PARTY IN INTEREST

The real party in interest is Konstantinos Amouris.

II. RELATED APPEALS AND INTERFERENCES

To the best of Appellant's knowledge and belief, there are no other related appeals or interferences for this application.

III. STATUS OF CLAIMS

Claims 1, 4-12 and 15 are pending in this application. Claims 1, 4-12 and 15 are rejected in the Final Office Action mailed on September 12, 2005. This rejection was upheld in an Advisory Action mailed on November 8, 2005. Claims 1, 4-12 and 15 are the subject of this appeal. A copy of Claims 1, 4-12 and 15 are presented in the Appendix of Claims.

IV. STATUS OF AMENDMENTS

An Amendment after the Final Action was filed on October 31, 2005 in response to the Final Office Action. In the Amendment, arguments were offered in response to a new prior-art reference cited against the Appellant in the Final Office Action; no amendments were made to the claims. The Advisory Action mailed on November 8, 2005 upheld the rejection in response to that Amendment. This Appeal Brief is in response to the Final Office Action that rejected Claims 1, 4-12 and 15 and the Advisory Action that upheld that rejection.

V. SUMMARY OF CLAIMED SUBJECT MATTER

The claimed subject matter relates to a novel method and system for allocating a set of time slots belonging to a common time division multiple access (TDMA) channel to a network of transceiver nodes. The disclosed time slot allocation method and system allocates time slot sub-sets of the parent set of time slots to each node in the network based on the node's position in space, according to a common, predefined function that assigns time slot sub-sets to space coordinates. The disclosed method and system resolves time slot sub-set allocation conflicts by forcing the conflicted nodes to share the common time slot sub-set.

A first aspect of the present invention, as claimed in independent Claim 1, relates to a method for allocating a set of time slots belonging to a common time division multiple access (TDMA) channel to a network of transceiver nodes. The method includes the steps of dividing the set of time slots into a plurality of time slot sub-sets (page 6, lines 6-19 and FIG 2-B); defining for each transceiver node a common function that assigns one time slot sub-set of the plurality of time slot sub-sets to each point in space, where each point in space is identified by a unique set of space coordinates (page 6, line 20 to page 8, line 19 and FIG 3); performing the following steps for each one of the transceiver nodes: periodically identifying a set of space coordinates; and allocating to each transceiver node time slots belonging to the time slot sub-set assigned by the common function to the point in space identified by the periodically identified set of space coordinates (page 8, lines 20-29 and FIG 4); and resolving time slot allocation conflicts occurring when at least two transceiver nodes are allocated time slots belonging to an identical time slot sub-set and the distance between the at least two transceiver nodes is less than a predetermined distance threshold (page 8, line 30 to page 9, line13). The resolving step is characterized in that it includes the step of allocating to each one of

the at least two transceiver nodes time slots belonging to a different time slot sub-set of the identical time slot sub-set (page 9, line 14 to page 10, line 2). The entire method as recited by Claim 1 is described in Appellant's specification from page 5, line 23 to page 10, line 2 and FIGs 2-B, 3, and 4.

A second aspect of the present invention is a system analogous to the method recited by independent Claim 1 and is recited by independent Claim 12. The system includes means for dividing the set of time slots into a plurality of time slot sub-sets (page 6, lines 6-19 and FIG 2-B); means for defining for each transceiver node a common function that assigns one time slot sub-set of the plurality of time slot sub-sets to each point in space , where each point in space is identified by a unique set of space coordinates (page 6, line 20 to page 8, line 19 and FIG 3); means for performing the following steps for each one of the transceiver nodes: periodically identifying a set of space coordinates; and allocating to each transceiver node time slots belonging to the time slot sub-set assigned by the common function to the point in space identified by the periodically identified set of space coordinates (page 8, lines 20-29 and FIG 4). The system also includes means for resolving time slot allocation conflicts occurring when at least two transceiver nodes are allocated time slots belonging to an identical time slot sub-set and the distance between the at least two transceiver nodes is less than a predetermined distance threshold (page 8, line 30 to page 9, line13). The resolving means is characterized in that it includes means for allocating to each one of the at least two transceiver nodes time slots belonging to a different time slot sub-set of the identical time slot sub-set (page 9, line 14 to page 10, line 2). The system as recited by Claim 12 is described in Appellant's specification from page 5, line 23 to page 10, line 2 and FIGs 2-B, 3, and 4.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Whether Claims 1, 4-12 and 15 are unpatentable under 35 U.S.C. §103(a) over U.S. Patent No. 6,788,702 issued to Garcia-Luna-Aceves et al. on September 7, 2004 (hereinafter "Garcia-Luna-Aceves et al.") in view of U.S. Patent No. 6,289,005 issued to Katz on September 11, 2001 (hereinafter "Katz"), and U.S. Patent No. 5,648,955 issued to Jensen et al. on July 15, 1997 (hereinafter "Jensen et al.").

VII. ARGUMENT

Claims 1, 4-12 and 15 which include independent Claims 1 and 12 are said to be unpatentable under 35 U.S.C. § 103(a) over Garcia-Luna-Aceves et al. in view of Katz and Jensen et al. Appellant contends that each of these claims is patentably distinct from the teachings of Garcia-Luna-Aceves et al., Katz and Jensen et al., taken alone or in any proper combination. Accordingly, Appellant hereby respectfully presents to the Board the following arguments in support of his position that Claims 1, 4-12 and 15 are patentably distinct over the teachings of Garcia-Luna-Aceves et al., Katz and Jensen et al., taken alone or in any proper combination.

I. IMPROPER 35 U.S.C. § 103(a) REJECTION FOR INDEPENDENT CLAIMS 1, 12

Before reaching the merits of the Appellant's position and the Examiner's position, Appellant notes that a proper rejection under 35 U.S.C. § 103 requires the following considerations as stated by Section 706.02(j) of the MPEP. Under a 35 U.S.C. § 103 rejection, the Examiner should set forth in the rejection:

(A) the relevant teachings of the prior art relied upon, preferably with reference to the relevant column or page number(s) and line number(s) where appropriate,

(B) the difference or differences in the claims over the applied reference(s),

(C) the proposed modification of the applied reference(s) necessary to arrive at the claimed subject matter, and

(D) an explanation why one of ordinary skill in the art at the time the invention was made would have been motivated to make the proposed modification.

In the Final Office Action, the Examiner sets forth the teachings of Garcia-Luna-Aceves et al.,

Katz and Jensen et al. for rejecting Appellant's independent Claims 1 and 12, and dependent Claims 4-11 and 15 under 35 U.S.C. § 103. Appellant respectfully submits that the Examiner does not set forth with respect to at least independent Claims 1 and 12 the requirements provided by items (A) and (C) of MPEP 706.02(j) which this Board has repeatedly stated is required for a proper 35 U.S.C. § 103 rejection.

In particular, in rejecting at least independent Claims 1 and 12, the Final Office Action does not set forth the relevant teachings of Katz which the Examiner relied upon as required by item (A).

In the Final Office Action the Examiner cites Katz as a prior-art reference against the element of allocating time slots to a node based on the node's position in space, namely "**defining for each transceiver node a common function that assigns one time slot sub-set of said plurality of time slot sub-sets to each point in space, wherein said each point in space is identified by a unique set of space coordinates; and performing the following steps for each one of said transceiver nodes: periodically identifying a set of space coordinates; and allocating to said each one of said transceiver nodes time slots belonging to the time slot sub-set assigned by said common function to the point in space identified by the periodically identified set of space coordinates**" as recited by Appellant's independent Claims 1 and 12.

The Examiner relies on the combination of excerpt [001] from Katz given below (column 2, lines 6-8) and the directional transmission property of SDMA systems (Katz: column 1, lines 17-21) described in excerpt [002] to **allege** that a hybrid SDMA/TDMA system "**would** allocate time slots in a cell based on position" (Final Office Action: page 3, lines 7-8), and therefore as teaching the element of allocating time slots to a node based on the node's position in space.

"**[001]** SDMA systems can also be used in conjunction with other existing multiple access

techniques such as time division multiple access (TDMA), code division multiple access (CDMA) and frequency division multiple access (FDMA) techniques."

"**[002]** In a space division multiple access system, the base transceiver station will not transmit signals intended for a given mobile station throughout the cell or cell sector but **will only transmit the signal in the beam direction from which a signal from the mobile station is received**. SDMA may also permit the base transceiver station to determine the direction from which signals from the mobile station are received."

However, **no supporting evidence, neither from Katz, nor from anywhere else, is set forth by the Examiner to support this allegation**. Specifically, the Examiner does not set forth any evidence from Katz that teaches, or suggests the steps of:

"defining for each transceiver node a common function that assigns one time slot sub-set of said plurality of time slot sub-sets to each point in space, wherein said each point in space is identified by a unique set of space coordinates; and

performing the following steps for each one of said transceiver nodes:

periodically identifying a set of space coordinates; and

allocating to said each one of said transceiver nodes time slots belonging to the time slot sub-set assigned by said common function to the point in space identified by the periodically identified set of space coordinates."

The only possible motivation in stating that Katz discloses the step of allocating time slots based on node position in space is hindsight interpretation of the reference (Katz) using Appellant's disclosure as a blueprint.

Additionally, the Final Office Action does not set forth a proposed modification of the method disclosed by Garcia-Luna-Aceves et al. that would allow it (Garcia-Luna-Aceves et al.) to be combined with the teachings of Katz, and Jensen et al. in order to arrive at the claimed subject matter disclosed by Claims 1 and 12, as required by item (C) of Section 706.02(j) of the MPEP.

Therefore, the rejection is legally and procedurally defective since it fails to satisfy items (A) and (C) of Section 706.02(j) of the MPEP, as required for a proper rejection under 35 U.S.C. § 103.

Accordingly, it is respectfully requested that the rejection under 35 U.S.C. § 103 with respect to independent Claims 1 and 12 be reversed and Claims 1 and 12 and their respective dependent claims be allowed.

Notwithstanding the Appellant's aforementioned contention of legal and procedural defectiveness with respect to at least independent Claims 1 and 12, the Appellant has set forth arguments in Sections II.A and II.B with respect to the patentability of independent Claims 1 and 12 over the teachings of Garcia-Luna-Aceves et al., Katz, and Jensen et al. taken alone or in any proper combination.

II. REJECTION OF INDEPENDENT CLAIMS 1 AND 12 AND DEPENDENT CLAIMS 4-11 AND 15

Appellant respectfully submits that the rejection with respect to at least independent Claims 1 and 12 as set forth in the Final Office Action is procedurally and legally defective for the reasons set forth in Part I above. Nonetheless, Appellant will now present arguments setting forth the patentability of independent Claims 1 and 12 and their respective dependent claims over the teachings of Garcia-Luna-Aceves et al. in view of Katz (Section A), and the teachings of Garcia-Luna-Aceves et al. in view of Jensen et al (Section B), in case the Board disagrees with Appellant's contention that the rejection of independent Claims 1 and 12 set forth in the Final Office Action is procedurally and legally defective.

Garcia-Luna-Aceves et al. discloses a method for allocating a set of time slots belonging to a common TDMA channel to a network of transceiver nodes. Specifically, according to the Final Office Action dated September 12, 2005, Garcia-Luna-Aceves et al. discloses the steps of:

a) Dividing the set of time slots into a plurality of time slot sub-sets, ("disclosed in column 6, lines 56-57 and column 11, lines 33-43, (as ASL is the same as a time slot sub-set)")

b) Allocating (time slots belonging to) time slot subsets to each one of said transceiver nodes, ("disclosed in column 16, lines 56-58 (ASLs are allocated among nodes)"), and

c) Resolving time slot allocation conflicts occurring when at least two transceiver nodes of said network of transceiver nodes are allocated time slots belonging to an identical time slot subset and the distance between said at least two transceiver nodes is less than a predetermined threshold ("disclosed in column 10, line 59 – column 11, line 9, and column 14, lines 20-26: a conflict among requested ASLs could occur when a node moves within the 2-hop neighborhood, i.e., within a predetermined distance that is related to the transmission range of the nodes, of a node in the network that it had previously been a three-hop neighbor of").

The Final Office Action states that Garcia-Luna-Aceves et al. fails to disclose the step of allocating time slots based on node position in space, which is identified periodically (i.e., "**defining for each transceiver node a common function that assigns one time slot sub-set of said plurality of time slot sub-sets to each point in space, wherein said each point in space is identified by a unique set of space coordinates; and performing the following steps for each one of said transceiver nodes: periodically identifying a set of space coordinates; and allocating to said each one of said transceiver nodes time slots belonging to the time slot sub-set assigned by said common function to the point in space identified by the periodically identified set of space coordinates**" as recited in Claim 1). The Final Office Action states that this step is disclosed in Katz, which discloses a hybrid SDMA/TDMA system. Appellant respectfully disagrees and presents the following arguments with respect to Katz:

A. REJECTION OF INDEPENDENT CLAIMS 1 AND 12 AND DEPENDENT CLAIMS 4-11 AND 15 OVER GARCIA-LUNA-ACEVES ET AL. IN VIEW OF KATZ

Appellant respectfully submits that **there is no motivation to combine Garcia-Luna-Aceves et al. with Katz** for providing a method for allocating time slot subsets to a node based on the node's position in space.

Garcia-Luna-Aceves et al. is directed to a method/system (referred to as NETS (Neighborhood Established Transmission Scheduling) protocol – column 9, lines 9 to 11) for allocating time slot subsets (i.e. ASLs – Active Scheduled Links) to nodes **dynamically (i.e., on-demand)**, in response to data exchange requests received by the NETS protocol from a layer residing above the NETS protocol. This is evident from excerpt [003] (Garcia-Luna-Aceves et al. column 14, lines 6 – 10).

> "**[003] When and why collision-free ASLs need to be established are decisions made at a layer on top of NETS** and the implementation details of a mechanism for making such decisions are not critical to the present invention."

The **on-demand establishment** of these collision-free ASLs is facilitated via the exchange of scheduling packets among neighboring nodes. This is evident throughout the description of Garcia-Luna-Aceves et al. and is immediately disclosed by the top 14 lines of the abstract given in excerpt [004] below, as well as the number 1 claim given in excerpt [005]:

> "**[004] Scheduling packets are exchanged among neighboring nodes** of a computer network. These scheduling packets include descriptions of a transmitting node's 2-hop neighborhood within the computer network, and **nodes are able to determine transmission schedules from information received via said scheduling packets**. Preferably, the computer network is a synchronized network in which time is divided into a number of frames, each of which are made up of a plurality of slots. In such cases, the exchange of scheduling packets should occur within a first number of the slots of each frame, preferably

in a common communication channel. **Transmission schedules may be determined, at least in part, because nodes advertise their availability using the scheduling packets.**"

"**[005] What is claimed is:**

1. A method comprising

exchanging scheduling packets among neighboring nodes of a synchronized wireless network in which time is divided into slots and the slots are grouped into frames, the **scheduling packets including descriptions of active scheduled links (ASLs)** between a transmitting node and its neighboring nodes, the **ASLs corresponding to a reserved group of contiguous slots** having a specific start slot and an associated data channel; and,

determining a transmission schedule from information received via said scheduling packets."

The Appellant's disclosure is directed to a method for allocating time slot subsets to nodes based on their position in space according to a common, predefined function "**that assigns one time slot sub-set of said plurality of time slot sub-sets to each point in space.**" Therefore, the allocation of time slot subsets to nodes in the Appellant's disclosure is **not dynamic** like it is in Garcia-Luna-Aceves et al., because it **does not happen in response to data exchange requests** received by the above layer, or changes in connectivity between neighboring nodes, making the entire component of exchanging scheduling packets among neighboring nodes unnecessary. Since the exchange of scheduling packets is the basis of the method (as is evident from Claim 1) disclosed by Garcia-Luna-Aceves et al. as it is used to facilitate on-demand, collision-free data exchange among neighboring nodes, making it unnecessary would defeat the purpose of using the method of Garica-Luna-Aceves et al.

Hence, Appellant respectfully submits that **there is no motivation to combine Garcia-Luna-Aceves et al. with Katz** to provide a method for allocating time slot subsets to a node based

on the node's position in space. The only possible motivation for combining Garcia-Luna-Aceves et al. with Katz is hindsight reconstruction using Appellant's disclosure as a blueprint. "[H]indsight-based obviousness analysis" has been characterized by the Federal Circuit as a "subtle but powerful attraction."

Furthermore, the Appellant disagrees with the Examiner's interpretation of the teachings of Katz and respectfully submits that Katz does not disclose or suggest the step of allocating time slots based on node position in space which is identified periodically.

As understood by Appellant, SDMA systems create a one-to-one mapping between a) the receivers of a base station, and b) the base station's antenna beam elements. This is evident from the following excerpt [006] from Katz (column 1, line 17 to line 21).

> "**[006]** In a space division multiple access system, the base transceiver station will not transmit signals intended for a given mobile station throughout the cell or cell sector but **will only transmit the signal in the beam direction from which a signal from the mobile station is received**. SDMA may also permit the base transceiver station to determine the direction from which signals from the mobile station are received."

Additionally, Katz states (column 2, lines 6-8) that:

> "**[007]** SDMA systems can also be used in conjunction with other existing multiple access techniques such as time division multiple access (TDMA), code division multiple access (CDMA) and frequency division multiple access (FDMA) techniques."

Appellant respectfully submits that excerpt [006] does not contain any language that discloses or suggests that bandwidth resources (i.e., time slots, codes, or frequencies) are allocated based on the position of the mobile station. It merely suggests that the base station will only transmit signals **(in its allocated bandwidth)** for a given destination in the beam direction that is associated with the intended destination. In other words, according to excerpt [006], the position (with respect to the

base station) of the intended destination **only determines which antenna beam element** will be activated by the base station, **not on which time slot** (if it's a TDMA system), **or code** (if it's a CDMA system), **or frequency** (if it's a FDMA system) **the chosen antenna beam element will be activated**.

In a hybrid SDMA/TDMA system, **the time slots** used by the base station to transmit to a mobile destination **are allocated first** (based on the overall time slot availability, existing allocations, and offered traffic load in the cell at the time of the data exchange), **and then**, based on which antenna beam element the particular mobile destination has been assigned to, **the base station determines which antenna beam element will be activated to transmit to that destination**. Therefore, **the position of the mobile destination in the cell** has nothing to do with the choice of the time slot made by the base station; it **only affects the choice of the particular antenna beam element once the time slot has been chosen**.

However, assuming arguendo that Katz implies an a priori mapping between antenna beam elements and time slots (i.e. time slots are allocated to antenna beam elements), this is still not the same as allocating time slots to a node based on the node's position in space, as recited by Appellant's claims.

Let's assume arguendo that Katz discloses Appellant's step of dividing the entire set of time slots (assuming a hybrid SDMA/TDMA system) to a predefined number of time slot subsets whose union gives back the entire set of time slots.

The Appellant's disclosure is directed to a method for allocating these time slot subsets to nodes (for scheduling transmissions) based on their geographic position, according to a common,

predefined function. Once each node has been allocated a time slot subset (for scheduling transmissions) according to Appellant's disclosure, Katz's hypothetical disclosure is directed to a method for splitting the allocated time slot subset into smaller pieces, and assigning each smaller piece to an antenna beam element. Hence, it can be clearly seen that the Appellant's disclosure is fundamentally different a) from what Katz actually discloses, and b) from what the Examiner believes Katz is disclosing.

The only possible motivation in stating that Katz discloses the step of allocating time slots based on node position in space is hindsight interpretation of the reference using Appellant's disclosure as a blueprint.

Therefore, Appellant respectfully submits that Katz fails to disclose, suggest, or imply at least the following elements of Claim 1:

"defining for each transceiver node a common function that assigns one time slot sub-set of said plurality of time slot sub-sets to each point in space, wherein said each point in space is identified by a unique set of space coordinates; and

performing the following steps for each one of said transceiver nodes:

periodically identifying a set of space coordinates; and

allocating to said each one of said transceiver nodes time slots belonging to the time slot sub-set assigned by said common function to the point in space identified by the periodically identified set of space coordinates."

Claim 12 includes similar recitations as Claim 1. This deficiency is not cured by Jensen et al.

B. REJECTION OF INDEPENDENT CLAIMS 1 AND 12 AND DEPENDENT CLAIMS 4-11 AND 15 OVER GARCIA-LUNA-ACEVES ET AL. IN VIEW OF JENSEN ET AL.

The Final Office Action states that Garcia-Luna-Aceves et al. fails to disclose the step of "resolving time slot allocation conflicts comprising allocating to each one of the two transceiver

nodes time slots belonging to a different time slot sub-set of said identical time slot subset". The Final Office Action states that this step is disclosed in Jensen et al. (column 18, lines 44-53).

Appellant respectfully submits that **there is no motivation to combine Garcia-Luna-Aceves et al. with Jensen et al.** for providing a method for resolving time slot subset allocation conflicts by forcing the conflicted nodes to share the same time slot subset.

Garcia-Luna-Aceves et al. resolves time slot subset allocation conflicts among nodes by **forcing the nodes to back off and choose alternative time slot subsets** (i.e. ASLs). This is evident from excerpt [008] given below (Column 16, lines 58 – 60):

"**[008] Nodes with conflicting ASLs must back off and choose alternative ASLs**"

The Appellant's claims recite resolving time slot subset allocation conflicts among nodes by **forcing the nodes to share the same time slot subset** (i.e., "wherein said resolving step comprises the step of allocating to each one of said at least two transceiver nodes time slots belonging to a different time slot sub-set **of said identical time slot sub-set**".

It can be seen from excerpt [008] that Garcia-Luna-Aceves et al. not only fails to provide motivation for combining it with methods that disclose sharing of time slot subsets in case of conflicting allocations, but actually **teaches away from it**. The only possible motivation for combining Garcia-Luna-Aceves et al. with Jensen is hindsight reconstruction using Appellant's disclosure as a blueprint. "[H]indsight-based obviousness analysis" has been characterized by the Federal Circuit as a "subtle but powerful attraction."

Additionally, the Appellant disagrees with the Examiner's interpretation of the teachings of Jensen et al. and respectfully submits that Jensen et al. does not disclose or suggest the

limitation recited below with respect to independent Claims 1 and 12 (i.e., "wherein said resolving step comprises the step of **allocating to each one of said at least two transceiver nodes time slots belonging to a different time slot sub-set of said identical time slot sub-set**"), and therefore, does not cure the deficiencies of Garcia-Luna-Aceves et al. Claim 12 includes similar recitations as Claim 1.

In Jensen et al. (column 18, lines 44-45), a conflict may happen between "two user stations on the **same minor frame**". The entire segment is given in the excerpt below [009].

> "**[009]** In rare instances, **two user stations on the same minor frame** in different cells but on the same frequency may encounter propagation characteristics in which the spatial and code separation are insufficient to prevent bit errors, thus causing the user stations to begin experiencing degradation of their RF links."

In the Appellant's disclosure, a conflict may happen when "at least two transceiver nodes of said network of transceiver nodes are allocated time slots belonging to an **identical time slot sub-set**". Therefore, it follows that the terms "**same minor frame**" and "**identical time slot sub-set**" are logically equivalent (i.e., analogous) for the purpose of determining what is disclosed by Jensen et al.

Jensen et al. resolves the conflict (column 18, lines 50-53 given in excerpt [010] below) by assigning the conflicting nodes to **different minor frames** (i.e., **different pieces of bandwidth**).

> "**[010]** In such cases, a time slot interchange (TSI) may be performed wherein one or both of the conflicting user stations **are assigned different minor frames** within their respective major frames to eliminate further collisions."

The Appellant resolves the conflict by assigning each of the conflicting nodes "**a different time slot sub-set of said identical time slot sub-set**" (i.e., **different sub-divisions of the same**

piece of bandwidth).

Therefore, **Jensen et al. not only fails to disclose the Appellant's resolving feature, but actually teaches away from it**. Katz fails to cure this deficiency.

The Examiner upheld the rejection with respect to Jensen et al. in the Advisory Action mailed on November 8, 2005 arguing that "the major frames of Jensen are time slot sub-sets of the total overall set of time slots; Jensen discloses assigning conflicting stations to minor frames that are still in the same major frame, i.e., time slot sub-set.", and therefore concluding that it discloses the Appellant's resolving feature.

The Appellant disagrees with the Examiner's interpretation that a "major frame" is analogous to a "time slot sub-set" as disclosed by the Appellant. **A "major frame" is the entire set of air channels supported by a particular base station. A "minor frame' refers to the piece of bandwidth allocated to support a bi-directional data exchange between the base station and a single user station over the air-channel assigned to that particular user station**. This is evident from the excerpt [011] (Jensen, column 1, line 64 to column 2, line 17) given below:

> "**[011]** In a preferred embodiment, **each base station may have a set of "air channels" which it polls**, e.g. by transmitting to each one in sequence. **The air channels supported by each base station are referred to as a "polling loop" for a particular base station**. A user station may receive information on an unoccupied air channel, receive the base station's transmission, and transmit information to the base station. Each base station may therefore simultaneously maintain communication with as many user stations as there are air channels in its polling loop. The ability of a user station to communicate on any unoccupied air channel makes the protocol air-channel agile. Each base station continually transmits on each one of its air channels in a predetermined sequence. Each base station transmission may be followed by a first gap, a user station transmission (if some user station attempts to communicate), and a second gap, before the base station transmits on the next air channel. **A base station transmission, first gap, user station transmission, and second gap are collectively called a "minor frame". A polling loop in which each air channel is polled is called a "major frame"**."

It can easily be seen from the above excerpt that **"major frame" and "time slot sub-set" are not analogous bandwidth constructs**. The Appellant respectfully submits that if "major frame" refers to an infinitely repeating polling loop of the **entire set of air channels** supported by a particular base station, and "minor frame" refers to a **single air channel** used to facilitate a data exchange between a single user station and the base station (quite possibly over multiple major frames), then "major frame" (and not minor frame) is analogous to the "total overall set of time slots", and "minor frame" is analogous to a "time slot sub-set". Another way to visualize this analogy is the following: the union (set summation) of all minor frames gives back the major frame, just as the union of all time slot sub-sets gives back the total overall set of time slots. Furthermore, a major frame is analogous to a time frame that repeats indefinitely, and minor frame is analogous to a single time slot of the time frame.

Major frames are bandwidth constructs that are assigned to cells (i.e. one major frame per cell), and as such, they cannot be allocated to individual user stations without breaking them first into smaller pieces called "minor frames". Therefore, since a minor frame is the largest unit of bandwidth that can be allocated to an individual user station, and a time slot sub-set is the largest unit of bandwidth that can be allocated to an individual transceiver in the Appellant's disclosure, it follows that a "minor frame" in Jensen et al. is the same as a time slot sub-set (as in "dividing said set of time slots into a plurality of time slot sub-sets" recited in independent Claims 1 and 12) in the Appellant's disclosure.

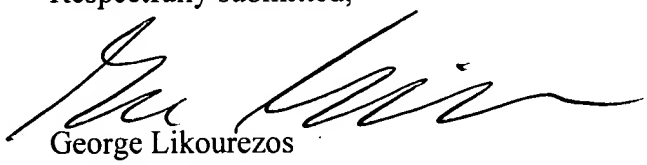
Accordingly, since the prior art references neither provide a motivation for combining them, nor they disclose or suggest all of Appellant's claim limitations, a requirement in establishing a prima facie case of obviousness, Appellant's independent Claims 1 and 12 and their corresponding

dependent claims are patentably distinct over Garcia-Luna-Aceves et al., Katz, and Jensen et al., taken alone or in any proper combination. Hence, withdrawal of the rejection under 35 U.S.C. §103(a) with respect to Claims 1 and 12 and their corresponding dependent claims and allowance thereof are respectfully requested.

CONCLUSION

The rejection with respect to independent Claims 1 and 12 and their respective dependent claims is procedurally and legally defective, and therefore the rejection with respect to these claims should be reversed. Additionally, independent Claims 1 and 12 and their respective dependent claims are patentable over Garcia-Luna-Aceves et al., Katz and Jensen et al., taken alone or in any proper combination, and therefore the rejection with respect to these claims should be reversed.

Respectfully submitted,



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VIII. APPENDIX OF CLAIMS

1. A method for allocating a set of time slots belonging to a common time division multiple access (TDMA) channel to a network of transceiver nodes, the method comprising the steps of:

dividing said set of time slots into a plurality of time slot sub-sets;

defining for each transceiver node a common function that assigns one time slot sub-set of said plurality of time slot sub-sets to each point in space, wherein said each point in space is identified by a unique set of space coordinates; and

performing the following steps for each one of said transceiver nodes:

periodically identifying a set of space coordinates; and

allocating to said each one of said transceiver nodes time slots belonging to the time slot sub-set assigned by said common function to the point in space identified by the periodically identified set of space coordinates; and

resolving time slot allocation conflicts occurring when at least two transceiver nodes of said network of transceiver nodes are allocated time slots belonging to an identical time slot sub-set and the distance between said at least two transceiver nodes is less than a predetermined distance threshold, wherein said resolving step comprises the step of allocating to each one of said at least two transceiver nodes time slots belonging to a different time slot sub-set of said identical time slot sub-set.

2. Cancelled

3. Cancelled

4. The method of claim 1, wherein the periodically identified set of space coordinates corresponds to said each one of said transceiver nodes current set of space coordinates.

5. The method of claim 1, further comprising the step of using said set of time slots belonging to said common TDMA channel for managing communication channel resources between a plurality of nodes of said network of transceiver nodes.

6. The method of claim 5, wherein each node of said plurality of nodes communicates on multiple channels on a time multiplex basis.

7. The method of claim 6, further comprising the steps of:

dividing each time slot of said set of time slots belonging to said common TDMA channel into a plurality of time sub-slots; and

designating one time sub-slot of said plurality of time sub-slots as a query time sub-slot;

wherein each source node of said plurality of nodes desiring to send data to a destination subset of said each source node's respective set of neighboring nodes transmits a query packet including the identifier of each node of said destination sub-set of said respective set of neighboring nodes during the query time sub-slot of an allocated time slot of said set of time slots belonging to

said common TDMA channel.

8. The method of claim 7, further comprising the steps of:

storing for each communicating node of said plurality of nodes:

a transmit set of time slot and channel pairs which can be used by said each communicating node to transmit data to said each communicating node's said respective set of neighboring nodes; and

a receive set of time slot and channel pairs which can be used by said each communicating node to receive data from each communicating node's said respective set of neighboring nodes; and

communicating a portion of the stored time slot and channel pair data between said each source node and said destination sub-set during the subsequent time sub-slots of said allocated time slot.

9. The method of claim 8, wherein said query packet further includes a selected sub-set of said transmit set of time slot and channel pairs stored for said each source node.

10. The method of claim 9, wherein said step of communicating said portion of the stored time slot and channel pair data is performed by sequentially repeating for each destination node of said destination sub-set of said each source node's said respective set of neighboring nodes the following

steps:

identifying by said each destination node an assignment set of time slot and channel pairs belonging to both the selected sub-set of said transmit set of time slot and channel pairs included in said query control packet and the receive set of time slot and channel pairs stored for said each destination node;

sending by said each destination node a response packet including said assignment set of time slot and channel pairs on which said each destination node desires to receive data from said each source node;

receiving by said each source node said response packet including said assignment set of time slot and channel pairs; and

sending by said each source node a confirmation packet including said assignment set of time slot and channel pairs which said each source node uses to transmit data to said each destination node.

11. The method of claim 10, wherein:

each neighboring node of said each destination node receiving said response packet identifies in the transmit set of time slot and channel pairs stored for said each neighboring node of said each destination node the time slot and channel pairs belonging to said assignment set of time slot and channel pairs; and

each neighboring node of said each source node receiving said confirmation packet identifies in the receive set of time slot and channel pairs stored for said each neighboring node of said each source node the time slot and channel pairs belonging to said assignment set of time slot and channel

pairs.

12. A system for allocating a set of time slots belonging to a common time division multiple access (TDMA) channel to a network of transceiver nodes, said system comprising:

means for dividing said set of time slots into a plurality of time slot sub-sets;

means for defining for each transceiver node a common function that assigns one time slot sub-set of said plurality of time slot sub-sets to each point in space, wherein said each point in space is identified by a unique set of space coordinates;

means for performing the following steps for each one of said transceiver nodes:

periodically identifying a set of space coordinates; and

allocating to said each one of said transceiver nodes time slots belonging to the time slot sub-set assigned by said common function to the point in space identified by the periodically identified set of space coordinates; and

means for resolving time slot allocation conflicts occurring when at least two transceiver nodes are allocated time slots belonging to an identical time slot sub-set and the distance between said at least two transceiver nodes is less than a predetermined distance threshold, wherein said resolving means comprises means for allocating to each one of said at least two transceiver nodes time slots belonging to a different time slot sub-set of said identical time slot sub-set.

13. Cancelled

14. Cancelled

15. The system of claim 12, wherein the periodically identified set of space coordinates corresponds to said each one of said transceiver nodes current set of space coordinates.